

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:  
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## PCT

WRITTEN OPINION

(PCT Rule 66)

Applicant's or agent's file reference <b>097923500048</b>		Date of Mailing (day/month/year) <b>21 MAR 2003</b>
International application No. <b>PCT/US02/19562</b>		REPLY DUE within 2 months/days from the above date of mailing
International filing date (day/month/year) <b>20 June 2002 (20.06.2002)</b>	Priority date (day/month/year) <b>20 June 2001 (20.06.2001)</b>	
International Patent Classification (IPC) or both national classification and IPC <b>IPC(7): G02B 6/28 and US Cl.: 385/16</b>		
Applicant <b>ARRYX, INC.</b>		

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
  - I ☒ Basis of the opinion
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement under Rule 66.2 (a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain documents cited
  - VII ☒ Certain defects in the international application
  - VIII ☐ Certain observations on the international application

3. The applicant is hereby **invited to reply** to this opinion.

**When?** See the time limit indicated above. ~~The applicant may, before the expiration of that time limit, request this Authority to grant an extension. See rule 66.2(d).~~

**How?** By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

**Also** For an additional opportunity to submit amendments, see Rule 66.4.  
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.  
For an informal communication with the examiner, see Rule 66.6

**If no reply is filed**, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 20 October 2003 (20.10.2003)

Name and mailing address of the IPEA/US  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231  
Facsimile No. (703) 305-3230

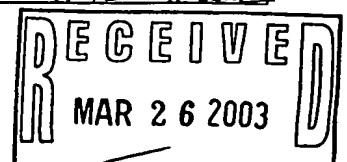
Authorized officer

KAVEH KIANNI

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Form PCT/IPEA/408 (cover sheet)(July 1998)



**WRITTEN OPINION**

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**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. STATEMENT**

Novelty (N)	Claims <u>NONE</u>	YES
	Claims <u>1-428</u>	NO
Inventive Step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-428</u>	NO
Industrial Applicability (IA)	Claims <u>1-428</u>	YES
	Claims <u>NONE</u>	NO

**2. CITATIONS AND EXPLANATIONS**

Claims 1-428 lack an inventive step under PCT Article 33(3) as being obvious over combination of Little et al. (US 6,052,495) and Hicks, Jr. (US 4,720,160) in view of Cai et al. (Highly efficient optical power transfer to whispering-gallery modes by using of a symmetrical dual-coupling configuration). Little teaches an apparatus/method of optically switching a signal (shown in fig. 3; abstract) the method comprising: placing a dielectric micro sphere capable of resonance for a specific wavelength of light (shown in fig. 5, item resonator 402 and specific wavelengths  $\lambda_1$ ), with a light alterable steady state index of refraction "n" substantially similar to the index of refraction of a first and second waveguide, in close proximity with the unclad or thinly clad regions of the first and second waveguides (see fig. 5, items 404, 402; col. 4, lines 29-40); providing the specific wavelength of light the dielectric micro sphere resonates for, as a signal within the first waveguide (see col. 2, lines 61-67); directing a sufficiently intense beam of light at the micro sphere whereby the index of refraction "n" of the dielectric micro sphere becomes substantially similar to the index of refraction of the waveguides (col. 2, lines 55-60; wherein refractive index of the resonator/resonator is compensated so as the index/wavelength from the first waveguide to micro sphere and then to second waveguide does not change-or their refractive indexes become substantially similar); switching the signal from the first waveguide across the dielectric micro sphere to the second waveguide; and terminating the intense beam of light (see fig. 5, items input/output waveguides and the resonator/resonator; col. 5, lines 14-25; wherein switching off terminates the beam light; Little further teaches wherein the laser beam passes through a Mach-Zender interferometer and the directing of the laser beam at the micro sphere is controlled by the Mach Zender interferometer (see col. 2, lines 2-6); wherein the sufficiently intense beam of light is a laser beam (see col. 2, lines 2-4); wherein the signal is within the wavelengths of an optical band within an optical network (see col. 2, lines 57-60). Hicks teaches optical resonant cavity filters that includes filtering system utilizing both depressive and resonant function (see abstract) and Cai teaches Micro-sphere Whispering Gallery Mode system that uses two optical fibers in add/dropping of wavelengths (see pages 656-657).

Claims 1-428 lack an inventive step under PCT Article 33(3), as being obvious over Little, Hicks, and Cai in view of Fan et al. (6,101,300), Kewitsch et al. (5,875,272), Ho (6,009,115), Ho (5,926,496), Vahala et al. (WO 00/35057), Vahala et al. (WO 00/29886), and Itchenko et al. (WO 01/59497). Fan, Kewitsch, Ho ('272), Ho ('496), Vahala ('057), Vahala ('886), and Itchenko teaches at least all limitations of the dependent claims in claims 1-428. Thus, it would have been obvious to a person of ordinary skill in the art when the invention as made to modify Little's optical switching system by adding Hicks' optical resonant cavity filters and that of Cai (Highly eff...) Micro-sphere Whispering Gallery Mode system in order to produce an optical switching system that includes limitations of the claims 1-428; since considering that the optical functions of waveguides and fibers are substantially similar the optical fibers provide a switching system that improves fabrication tolerance and compensates for possible drift of the signal wavelength (see col. 2, lines 57-58).

Claims 1-428 meet the criteria for industrial applicability set out in PCT Article 33(4), because the claimed subject matter is useful in the electrical industry.

ANY RESPONSE MAY BE FAXED TO:  
OFFICE OF THE SPEICAL PROGRAMS EXAMINER  
TECHNOLOGY CENTER 2800  
(703) 305-0843

----- NEW CITATIONS -----  
NONE

# WRITTEN OPINION

International application No.

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## I. Basis of the opinion

### 1. With regard to the elements of the international application:\*

- ☒ the international application as originally filed
- ☒ the description:
  - pages 1-59, as originally filed
  - pages NONE, filed with the demand
  - pages NONE, filed with the letter of \_\_\_\_\_.
- ☒ the claims:
  - pages 60-139, as originally filed
  - pages NONE, as amended (together with any statement) under Article 19
  - pages NONE, filed with the demand
  - pages NONE, filed with the letter of \_\_\_\_\_.
- ☒ the drawings:
  - pages 1-24, as originally filed
  - pages NONE, filed with the demand
  - pages NONE, filed with the letter of \_\_\_\_\_.
- ☐ the sequence listing part of the description:
  - pages NONE, as originally filed
  - pages NONE, filed with the demand
  - pages NONE, filed with the letter of \_\_\_\_\_.

### 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

### 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

### 4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages NONE
- ☐ the claims, Nos. NONE
- ☐ the drawings, sheets/fig NONE

### 5. ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed."

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**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

**TIME LIMIT:**

The time limit set for response to a Written Opinion may not be extended. 37 CFR 1.484(d). Any response received after the expiration of the time limit set in the Written Opinion will not be considered in preparing the International Preliminary Examination Report.

**WRITTEN OPINION**

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**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

Claims 426 and second 426 are objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or contents thereof: There are two different claim 426. Claims need to be renumbered from 1-428 to 1-429.